What is claimed is:

1. A bi-phasic or multiphasic formulation comprising an oligonucleotide or bioequivalent thereof, said oligonucleotide comprising one or more phosphorothioate linkages, and an antioxidant which partitions into the aqueous phase of said formulation.

2. The formulation of claim 1, wherein said oligonucleotide or bioequivalent thereof comprises one or more base modifications.

3. The formulation of claim 1, wherein said oligonucleotide or bioequivalent thereof comprises one or more modified internucleoside linkages in addition to said one or more phosphorothioate linkages.

4. The formulation of claim 1, wherein said oligonucleotide or bioequivalent thereof comprises one or more sugar modifications.

5. The formulation of claim 4, wherein said sugar modification is a 2'-methoxyethoxy modification.

6. The formulation of claim 1, wherein said antioxidant is selected from the group consisting of cysteine, glutathione, α-lipoic acid, a 2-mercapto-5-benzimidazole salt and a 2-mercaptoethanesulfonic acid salt.

7. The formulation of claim 1, wherein said oligonucleotide is a ribozyme, aptamer or antisense oligonucleotide.

8. A method of preventing desulfurization of an oligonucleotide or bioequivalent thereof comprising one or more phosphorothioate linkages in a bi-phasic or multi-phasic formulation, comprising including in said formulation an antioxidant which partitions into the aqueous phase of said formulation.

9. The method of claim 8, wherein said oligonucleotide or bioequivalent thereof comprises one or more base modifications.

10. The method of claim 8, wherein said oligonucleotide or bioequivalent thereof comprises one or more modified internucleoside linkages in addition to said one or more phosphorothioate linkages.

11. The method of claim 8, wherein said oligonucleotide or bioequivalent thereof comprises one or more sugar modifications.

12. The method of claim 11, wherein said sugar modification is a 2'-methoxyethoxy.

13. The method of claim 8, wherein said antioxidant is selected from the group consisting of cysteine, glutathione, α-lipoic acid, a 2-mercapto-5-benzimidazole salt and a 2-mercaptoethanesulfonic acid salt.

14. The method of claim 8, wherein said oligonucleotide is a ribozyme, aptamer or antisense nucleic acid.